

REMARKS

Reconsideration of the application is requested.

Claims 1-10 are now in the application. Claims 1-10 are subject to examination. Claims 7-10 have been added.

In item 2 on pages 2 and 3 of the above-identified Office Action, claims 1-4 and 6 have been rejected as being obvious over Japanese Patent No. JP 11-116399 to Yasuo (hereinafter Yasuo) in view of Japanese Patent No. JP 11-116398 to Shigehiro (hereinafter Shigehiro) under 35 U.S.C. § 103.

Yasuo teaches that in order to protect a graphite crucible for the purpose of growing silicon carbide crystals with the graphite crucible being heated from the outside, there are tantalum plates disposed around the inner walls. The thickness of the walls is not described in detail, however, they must be massive plates in each case. By heating a crucible filled with a high-purity carbon, the tantalum plates are carbonized so that a tantalum carbide layer (coating) forms on that side which faces the crucible interior. The step of carbonizing the tantalum plates is performed prior to the actual growth. The tantalum carbide layer is illustrated in Fig. 1 at the bordering region between the tantalum plate and the interior of the crucible.

Shigehiro teaches that for growing silicon carbide crystals, use is made of a metal crucible that is heated from the outside. By adding a high-purity graphite powder, a metal carbide coating forms on the inner side of the metal crucible. This coating is designated in the text as a membrane with a thickness of $> 10 \mu\text{m}$ whereby the term "membrane" can only indicate that the coating is permeable for specific components. In this reference also, the step of carbonizing is a separate step prior to the actual crystal growth. The coating is very clearly a coating joined with the metal walls and not a separate foil or the like. In the next to last line in the Office action (page 2), the term "lining" is used therefor. However, applicant states that a liner should be understood as a separate part and not that of a coating.

According to claim 1 of the instant application, the last feature pertains to lining the crucible with a foil from a high-temperature resistant material, such as a tantalum foil. It is essential that the foil is continuously carbidized by adding graphite. By forming carbide, an increased volume is obtained as an essential inventive effect, which is recognizable in a quasi two-dimensional manner due to the surface-like formation of the foil. The carbidizing,

however, does not occur by adding pure carbon powder in a separate step prior to the crystal growth but rather by the carbon-containing gas species being released from the SiC source material during the crystal growth.

The enlarging of the surface however provides the self-sealing effect that is described in detail on pages 8-10 of the specification of the instant application and is emphasized as an advantage of the invention.

It is to be noted that the indicated effect of the invention only occurs when there is a separate foil (essentially two-dimensional) in which the carbide formation occurs during the actual crystal growth. With a massive metal plate disposed rigidly in the crucible or forming the crucible itself, this effect is not possible (as taught in Yasuo). The penetration of carbon results in a carbidizing close to the surface with a volume-increasing effect. The strong three-dimensional configuration leads in this case to volume tensioning that could then result in the brittle carbide material coming off, should the occasion arise. Furthermore, a self-sealing by the expansion of the volume of the carbides cannot be obtained due to the chronological separation of the carbidizing and the crystal growth.

It must be pointed out that only the foil provides the lining of the crucible in the sense of a coat lining, for example, in which the foil is movable in the form. The Examiner's statement in item 2, next to last line, that also in Shigehiro a lining of TaC is given, is respectfully believed not to be correct. As outlined in detail above, there is solely a coating representing a layer firmly joined with the metallic material.

It is believed that, contrary to the state of the art, the foil according to the invention and which has a volume-changing affect as used in a surface-like manner in the invention, is a convincing argument for the invention.

Claims 7-10 have been added to the application to further emphasis the volume-changing affect. Support for claims 7-10 comes from original claim 1, page 9, lines 1-18 and page 15, lines 16-21.

In item 3 on page 4 of the above-identified Office Action, claim 5 has been rejected as being obvious over Yasuo in view of Shigerhiro and further in view of U.S. Patent 5,968,261 to Barrett et al. (hereinafter Barrett) under 35 U.S.C. § 103.

Claim 5 is dependent on claim 1, claim 1 is believed to be patentable and therefore claim 5 is also believed to be patentable.

It is accordingly believed to be clear that none of the references, whether taken alone or in any combination, either show or suggest the features of claims 1 or 7. Claims 1 and 7 are, therefore, believed to be patentable over the art. The dependent claims are believed to be patentable as well because they all are ultimately dependent on claim 1 or 7.

In view of the foregoing, reconsideration and allowance of claims 1-10 are solicited.

Please charge any other fees that might be due with respect to Sections 1.16 and 1.17 to the Deposit Account of Lerner and Greenberg, P.A., No. 12-1099.

Respectfully submitted,



For Applicants

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